Three-Dimensional Awareness

The notice of arrival and its role in Maritime Domain Awareness.

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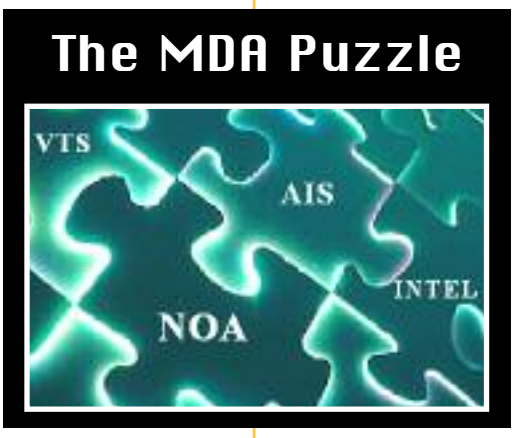
Imagine this scenario: On the dawn of the 11th day at sea, the crewmembers of the fictional product tanker *Neptune* rise in preparation for their first port call in the United States. The *Neptune* is struggling to make its notice of arrival (NOA) time, after taking some heavy seas during its transatlantic trip. The bar pilots are keeping an eye on the vessel's progress, so they can position their pilot boat accordingly. However, the pilots and the local U.S. Coast Guard units are not the only groups tracking the tanker's progress and preparing for its arrival.

Secretly, a four-man crew is approaching the pilot boarding area from the south, in a 100-foot, power-driven supply ship. Their mission is to ram the tanker and deliver a deadly cargo of ammonium nitrate fuel oil. As the supply ship comes up to speed, the captain on the bridge of the tanker notices the smaller ship on what looks to be a collision course. The tanker is practically helpless, with steering capabilities reduced at slow speed, so the captain can only hope this unknown vessel is going to alter course as he gives a few perfunctory pulls on his ship's whistle. Onboard the smaller supply vessel, the crew has no intention of stopping as they jam the throttle to full ahead…



Maritime Domain Awareness

Such a doomsday scenario may seem a bit extreme. It is hard for the general public to imagine such a threat and, therefore, may assume a threat like this does not exist. But naivety is not a defense against attacks on U.S. ports and infrastructures. As the lead federal agency for maritime security, the U.S. Coast Guard is actively working to minimize the possibility of success of such a scenario by enhancing and expanding Maritime Domain Awareness (MDA).

One dimension of MDA is the notice of arrival regulation (33CFR160.2), which, generally speaking, requires vessels to report their arrival data, date, time, location, crew, cargo, and passengers to the Coast Guard for vetting. It is a static tool, in that information is only available when submitted by the user. However, it is vital, because so much information is received that is not currently captured in other MDA initiatives. The information captured in the NOA allows the Captain of the Port (COTP) to preposition the proper resources, such as armed boarding teams (Figure 1) and boat crews, to maximize effectiveness. Or, in the case of a product tanker arriving, the COTP may implement a moving security zone, based on available intelligence, for the date of arrival.

However, the NOA is only one dimension of Maritime Domain Awareness. Three-dimensional coverage requires real-time information feeds, such as vessel tracking systems (VTS) and automatic identification system data, coupled with credible intelligence. This provides more insight into what the vessel is actually doing and what information may have been purposely omitted from the NOA.

Figure 1: A boarding team positions itself to board a Bahamian flagged cargo ship. PA3 Donnie Brzuska, USCG.

Take the tanker scenario above, and assume that one of the unlicensed crewmembers is a known terrorist. The captain enters the person's alias and sends the completed NOA off to the Coast Guard as required. The staff at the Intelligence Coordination Center (ICC) Coast Watch processes the NOA and finds this crewmember's alias matches one on a terrorist database. The ICC then informs the Captain of the Port and local law enforcement of this crewmember's presence, as well as the vessel's noncompliance. The vessel tracking system and automatic identification system data cannot provide a crewmember's name, so it is vital to integrate the current systems to provide this layered defense.

Integration of Intelligence

The integration of the various data feeds and information sources will make it far easier to track vessels in U.S. ports and waterways. Currently, the Coast Guard uses what is known as the COP, or common operating picture. It provides exactly that—a computer-generated picture of all surface operations in the Maritime Domain. Using the NOA, AIS, and other tracking feeds, this system is able to categorize and track a vessel based on NOA data, intelligence data, and other external sources. The scope is far greater than that of the current vessel tracking system and automatic identification system coverage. This overarching view allows a vessel to be tracked point to point, with no limited shadow areas. The COP centralizes the effort of many systems, which not only saves time in the screening process, but reduces the number of personnel needed behind a desk when they can be better used on the dock or underway on patrol.

Although a significant hurdle has been created for would-be terrorists, there is still much to be done. The Coast Guard is continually looking for ways to improve its current NOA regulation. Currently, the NOA regulation only requires reporting data on U.S. and foreign-flagged commercial vessels greater than 300 gross tons. The regulation also requires information from foreign-flagged recreational vessels greater than 300 gross tons and for any vessel, either U.S. or foreign, carrying any certain dangerous cargo. This equates to roughly 600 NOAs processed daily, which is a sizable population of the total arrivals. However, nearly any ship is capable of creating a threat to homeland security, including smaller commercial and recreational vessels.

Closing the Gap

To enhance domain awareness, it is necessary to increase the scope of the current NOA applicability to include all foreign commercial vessels, regardless of tonnage, and any U.S. commercial vessel arriving from a foreign port. All inbound vessels need to be screened, particularly those arriving from foreign ports or places, to vet their crew and cargo. The security screening process can only begin when the notice of arrival is submitted.

Let's go back to the tanker from the scenario, which is about to encounter a deadly threat in the form of a 100-foot supply vessel. Response is limited to the time from the first acknowledgement of the threat until impact. This could be hours or, in some cases, just a few minutes. Probability favors the attacker. However, the missing piece from our tanker scenario is intelligence. The story is now changed to include credible intelligence that informs the Coast Guard of a plan to destroy the tanker. This intelligence may be nautical charts and an operation outline found in a hotel room or data from an informant. With this information, the tanker is determined to be the target. The COTP can then order the tanker to divert from the port, while the Coast Guard leads a law enforcement team to the smaller threat vessel and intercepts the four would-be terrorists before they come within visual contact of the

tanker. That's having Maritime Domain Awareness.

So, with the notice of arrival, the Coast Guard knows when and where the tanker is arriving. We know the crew, we know the cargo, and we know all of the hard data. AIS and VTS tell where the vessel is, its speed, and what course it is on. At this point, the Coast Guard has two-dimensional coverage. Intelligence can bring all this information together and give it some purpose. Not every ship is a product tanker and receives as much scrutiny. But add some credible threat, and now this actionable information can be used to allocate the proper response (Figure 2). This intelligence may come in the form of high-level knowledge passed between agencies, or it may come from the average boater concerned about suspicious activity.

The Coast Guard has developed a program to help the general public assist in protecting U.S. waterways. America's Waterway Watch (www.americaswaterwaywatch.org) provides the proper channels for the public to contact the Coast Guard in the event they witness unusual activity in and around U.S. maritime infrastructure. Many eyes on the water are needed, and who better to be aware of the intricacies of a harbor or coastal area then the boaters and workers who spend their days on and around it?

So what is the answer? Simply put, if the United States wants to have more comprehensive Maritime Domain Awareness, the scope of applicability for the notice of arrival and other tracking initiatives such as AIS needs to be expanded. The Coast Guard cannot track what it does not require, so the first step is including more vessels. Will this be a waste of time because the majority of those vessels are compliant and cause little concern to the COTP? Yes, the vast majority will be vetted and cleared without incident, but, for that small population of vessels that cause concern, the Coast Guard can direct its response in a coordinated manner.

For example, more time can be spent researching why the AIS feed indicates a port call at Berth A, while the NOA indicates a port call at Berth B. Maybe this anomaly is operator error; however, it might be something else more devious. This layered approach to MDA can only be successful if the Coast Guard continues to utilize the proper tools as well as enhance them. The notice of arrival is but one piece of the Maritime Domain Awareness puzzle, but, without it, the puzzle is incomplete.

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Figure 2: The U.S. Coast Guard Cutter *Adak* holds position alongside a cargo dhow. PA1 John Gaffney, USCG.